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THE EXCAVATING ENGINEER PUBLISHING COMPANY

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267 NATIONAL AVENUE MILWAUKEE, WIS., U. S. A.

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Fig. 1. Two 70-C Bucyrus Shovels Meeting at Grade Hamilton & Gleason's Contract.

Fig. 2. The Detour Line 1000 Feet Up The Side of The Mountain.—Hamilton & Gleason's Contract.

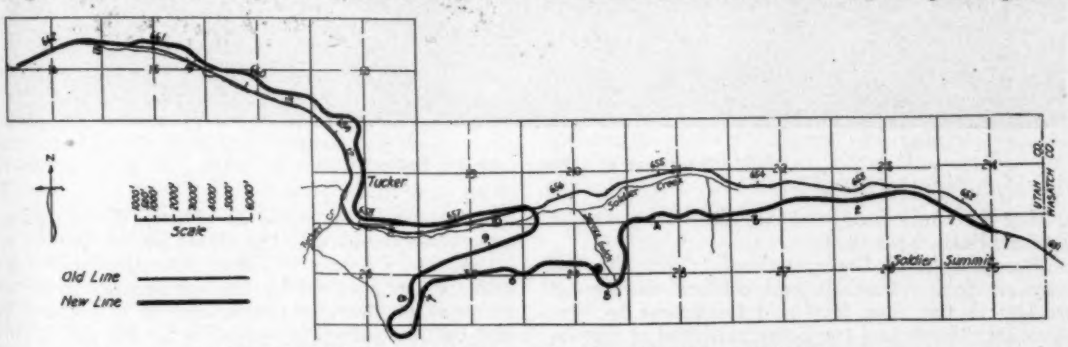
STEAM SHOVEL WORK ON THE SOLDIER SUMMIT DETOUR LINE—D. & R. G. RY., COLORADO.

The Excavating Engineer

Vol. 10 MARCH, 1914 No. 6

Construction of The Soldier Summit Detour Line, Denver & Rio Grande Railroad

IN January 1913 work was started on the grade elimination of the Denver and Rio Grande R. R. between Soldier Summit, Colorado, and Tucker, Utah. The contract has recently been completed and trains are now operating over the new low grade line. The problem which confronted the railroad engineers was directly the opposite of that which usually has to be contended with in the revision of main line track. The greater part of the freight traffic here is westward which formerly had movement is almost exclusively westward, the empty cars being hauled eastward to supply the demand for loading. The old four per cent gradients had the effect of limiting the capacity of the line, because, as mentioned before, the weight of the descending trains was subject to the capacity of the air pumps on the locomotives. Passenger traffic consists of three heavy through trains daily, each way, which number is increased during the summer months because of the necessity of operating extra



New and Old Lines, Soldier Summit Detour, Rio Grande Railroad.

to be taken down a 4% grade between the two points above mentioned, a distance of seven miles. Grades as heavy as this are exceptional on main lines even through the mountain passes of the transcontinental railways. Although east bound traffic was handled with difficulty the most serious problem was the limit in the capacity of the air pumps in handling the descending trains with any degree of safety.

Freight traffic on this portion of the line consists principally of coal and coke from Emery and Carbon counties, Utah. This freight is collected by various branches and spurs from the main line on the easterly slope of the Wasatch mountains. The loaded sections. Consequently the maximum grades have been reduced from 4% to 2%, thereby increasing the length of the line 4½ miles, but effecting great economies in the expense of operation.

The main line of the Denver & Rio Grande Railroad between Denver, Colo. and Ogden, Utah, crosses two mountain ranges. The main range of the Rocky Mountains in Colorado, the Continental Divide, and the Wasatch Mountains in Utah, the eastern rim of what is known as the Great Basin. The line pierces these ranges by means of the Tennessee Pass in Colorado and Soldier Summit in the Wasatch Mountains. The two ranges are

similar in the respect that the passes over both are approached from the east on very much lighter gradients than the descent on the west. For example, the maximum gradients ascending from the east towards Tennessee pass in Colorado are 1.42 per cent while descending gradients on the western slope are three per cent maximum, while the ascending radients to Soldier Summit in the Wasatch mountains from the east are 2.40 per cent and the maximum descending gradients from Soldier Summit westerly are four per cent.

Until 1890 the Denver & Rio Grande line was narrow gauge. In this year, however, standard gauging was started and at the same time the 4 per cent grade through Tennessee Pass west to Minturn, a distance about 30 miles, was reduced to 3 per cent, leaving the 7 mile link between Soldier Summit and Tucker, Utah, 4 per cent.

On account of the growth of traffic, the line between Soldier Summit and Tucker was double tracked in the year 1900 and from time to time thereafter the second track was extended at various critical points, so that now the double track is continuous throughout the Wasatch mountains from Helper to Thistle, a distance of fifty miles. At various times in the past surveys have been made in an endeavor to eliminate the four per cent gradients between Soldier Summit and Tucker. The physical characteristics of this portion of the Wasatch range and the topography of the country adjacent to the present line seemed to impose unusual difficulties for the development of a line on the westerly slope to such an extent as would permit material reduction in the maximum gradients. In 1909 extensive additional surveys were made and the problem studied from all points of view, with a result of the final adoption of a two per cent maximum gradient descending westerly from Soldier Summit. These surveys brought out the fact that by taking advantage of a lighter gradient west of Tucker and constructing a new line fifteen miles in length the seven miles of four per cent gradients could be eliminated by the addition of only 4.46 miles increased length of line.

The line has been constructed as a double track line with the tracks laid on 15 foot centers. The roadbed, therefore, necessitates a top width of 35 feet. Great difficulties were encountered by the contractors in getting equipment on the line, on account of the mountainous character of the country and of the wide divergence of the new from the old line at various places. At some points temporary tracks were laid to the new line and the steam shovels moved under their own power over these, while at others, steep inclines were constructed and the steam shovels hauled up by means of cables. These difficulties were considerably augmented by the requirement that the construction must be commenced in a few months and the line placed in operation by the fall. This fact necessitated an abnormally large amount of equipment, force reports showing that at one time twenty steam shovels were at work. Some of these, in addition to working day shifts, were required to work night shifts for weeks at a time.

The New Line at a Point Opposite Tucker, Utah.

The general contractors on this work, the Utah Construction Company of Ogden, Utah, sublet the entire line with the exception of approximately two miles, which they did with their own forces. We are informed that they used at Soldier Summit one 70 ton Bucyrus shovel and one model 20 Marion. At their camp No. 1 near Tucker, Utah, they operated one 70 ton Bucyrus and one model 61 Marion shovel. The sub-contractors and their outfits were distributed along the line starting at Soldier Summit about as given below.

As stated, The Utah Construction Co. had the first two miles on which they operated their four shovels. B. H. Davis followed with a mile of work on which he used a Bucyrus 40-R. Tyler & Littlefield has one 70-C Bucyrus and later used a 70 ton Bucyrus which was leased from the Utah Copper Company. Following this Dooling Brothers had a total of about three miles of work and used one 70 ton Vulcan shovel and one model 60 Marion together with full equipment of Vulcan locomotives, cars, etc. Hamilton & Gleason came next with a heavy piece of work on which they operated two 70-C Bucyrus shovels. Corey Bros. Construction Company had one 70 ton Bucyrus, one Marion-Osgood 60 ton, one Atlantic shovel, and later secured a model 20 Marion from the Utah Construction Company. They, it seems, had some of the most difficult work on the line. It was necessary to pull all of their equipment up a steep 1500 foot incline with heavy cable and electric hoist. They were the last to complete their work. The Christensen Construction Company used two 70-C Bucyrus shovels, L. R. Wattis Company two Marion model 60 shovels and Reynolds Ely Construction Company two 60-C Bucyrus shovels.

In connection with Dooling Brothers' job it might be interesting to note here that their old time Vulcan 70 ton shovel, shop No. 1228, is reported to have made one of the best records on the entire line. As nearly as we can determine at this writing it handled approximately 125,000 yards in 89 days. Much larger records have been made throughout the country, but as the haul was a half mile in many cases and as much of the material was loose rock, it appears that this ought to stand for some time to come. As a matter of fact Dooling Brothers made a splendid record on their entire job. Their model 60 Marion did its share of the work, but the performance of the Vulcan shovel is considered quite remarkable. Dooling Brothers are naturally very proud of their achievements, and from all accounts the work moved along smoothly at all times, and was handled with much ability by the three brothers, Mike, Robert and Charlie.

We are indebted to Hamilton & Gleason for the photographs of this interesting piece of work. Fig. No. 1 shows their two 70-C Bucyrus shovels head-on at the finish of their two mile contract. Undoubtedly theirs was the heaviest piece of work on the entire line, fully 70 per cent of it being hard rock which had to be blasted. The strata laid in a peculiar manner, inclining upwards; consequently it was very difficult to blast and did not break up readily, which required most unusual shovel service. The manner in which they handled their job was a credit to their management and ability.

Fig. No. 2 shows the new detour line at the point where it is about 1000 ft. up the side of the mountain. One of Hamilton & Gleason's 70-C Bucyrus shovels can be seen in action. Lower down at the foot of this mountain and to the right of the picture is Hamilton & Gleason's camp No. 1. The small white house is the "field home" of Mr. and Mrs. G. W. Hamilton, which is, in fact, a converted box car completely lined with matched lumber and divided into two very comfortable rooms; indeed, the only thing that indicates that it was formerly a box car is the fact that it is mounted on trucks and is transported from one job to another with the balance of their train load of equipment. In the valley can be seen the old line of the D. & R. G. which has now been entirely abandoned.

Fig. No. 3 is a general view of the new line and the old at a point opposite the town of Tucker. The former here is 1000 feet higher than the old line. This height gradually decreases to the East and West to the points where the new line joins the old. At one point the new line descends to 22 feet below and crosses under the old line. From here it gradually rises higher on the side of the mountain for a distance of about 4 miles, finally joining the old line at Soldier Summit. The highest point is at Soldier Summit from where it descends with a 2 per cent grade to a point two miles west of Tucker, Utah.

In addition to reducing the grade the railroad has added about fifteen miles of unsurpassed scenery to their line. Traveling over the old line in the valley was never interesting as compared with the view to be seen in the Royal Gorge or the Canyon of the Rio Grande in Colorado. The new line gives the traveler an entirely different view from its 1000 ft. elevation, as the gulches, rivers and valleys are crossed and recrossed and afford a beautiful view all seasons of the year.

The total excavation amounted to approximately 3,500,000 cubic yards, about 33 per cent of which was solid rock. About 13,400 cubic yards of concrete was placed.

The work was under the personal supervision of J. G. Gwyn, chief engineer, and Arthur Ridgway, assistant chief engineer of the Denver & Rio Grande R. R. L. B. Furman, construction engineer was in direct charge of location and construction.

Little Jimmy came to Toronto from his northern Ontario home, where colored folks are hardly ever seen. One day when he was out walking with his Uncle Bob they happened to pass a colored woman, and the following conversation took place:

"Say, uncle, why did that woman black her face?" said Jimmy.

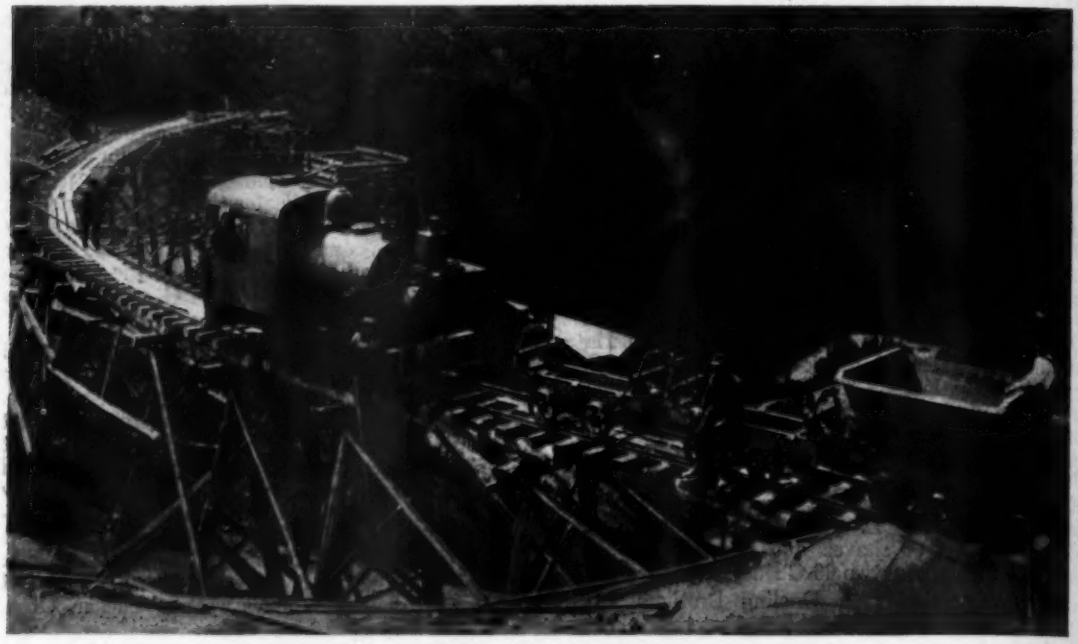
"Why, she hasn't blacked her face—that's her natural color," said uncle.

"Is she black like that all over?" asked Jimmy.

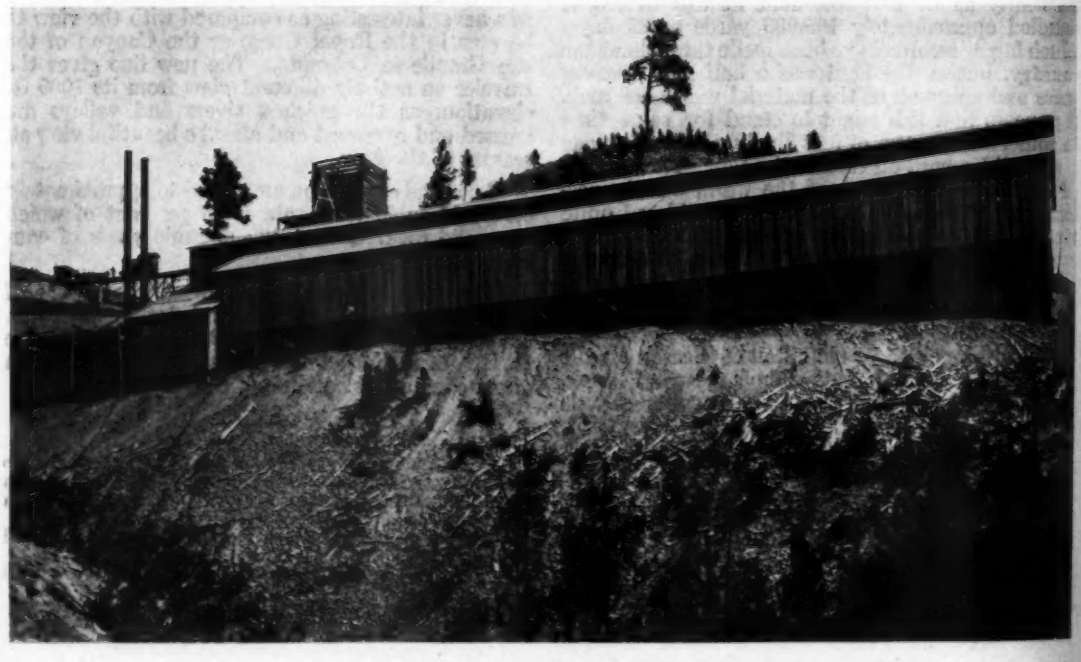
"Why, yes."

"Gosh, uncle, you know everything, don't you?"

—*Ideal Power.*



Trestle, Locomotive and Ore Train. The Smelter May Be Seen Below.



Crusher and Smelter Plant, Beaver Creek Mining Company.

Mining Gold With a Revolving Shovel in The Little Rockies

IN the Little Rocky Mountains in northern Montana, fifty miles southwest of Dodson, The Beaver Creek Mining Company are using a small revolving shovel for mining gold ore and stripping the overburden.

The proposition is an unusual one. The gold vein which runs to depths of about 130 feet in soft shale has occasional outcroppings on the side of the mountain. The shovel follows these veins, strips whatever overburden there is and mines the ore. The operation has been highly successful.

The shovel used is a 14-B Bucyrus equipped with a ⅝ yard dipper. Its weight in working order is 90 tons. The photograph on our front cover gives a good idea of the conditions under which it operates.

In order to get the machine to the mine it was necessary to haul it in a knocked down condition in heavy wagons a distance of fifty miles from Dodson to the mine, which is near Whitcomb. Here it was set up and ready to dig in six days time. Besides the Bucyrus Company's engineer P. W. Hanks, a gang of four men were employed for the purpose.

As stated before, the shovel follows the vein along the side of the mountain, loading the ore into five yard steel hopper cars, which are hauled by a 12 ton Davenport locomotive a distance of one-half mile to the mill. Here the ore is dumped into a bin from which it is run through a No. 5 crusher.

The daily output averages about 300 tons.

The face worked against of course varies, but it averages about 12 feet in height. The material is a soft limestone formation which the shovel handles easily without blasting. Only occasional dobie shots are used on the largest rocks.

There is not much lost time in the shovel operation. When it is not loading the ore it strips the overburden and waste.

Two tracks are laid behind the shovel, one for the ore and one for the waste material. The shovel loads directly in the rear.

In some places it is possible to cast the waste over but as a rule it is dumped into cars, hauled a short distance and dumped at a convenient point. A good days work is about 250 cubic yards of ore and 200 cubic yards of waste in eight hours.

The shovel burns pitch pine for fuel, about a cord and a half being consumed a day at a cost of $4.00 per cord.

The water is pumped from a nearby spring to a storage tank from where it is pumped by a Prescott pump to the mill, the shovel and the locomotive.

The track over which they are operating has a grade of 12%. The shovel has frequently climbed a 14% grade under its own power.

The revolving type of shovel has proved to be splendidly adapted to this class of work. It is easily dismantled and re-erected, it is light enough to be moved over very rough country with comparative ease, it has high tractive power, it can load cars in any position and finally it can select the materially very successfully.

Natoma Reclamation Work Held Up By Floods

R. J. Leonhardt of Sacramento, Calif., has given us a vivid description of the flood which recently swept the Sacramento Valley and inundated the three Bucyrus dragline excavators which the Natomas Consolidated were using on their reclamation work in this district. The flood occurred on December 31st and as all three of the draglines were on the lowest ground, they are still in water. An attempt was made to move out the pumps, tents and other equipment which were inundated. This had to be done in less than an hour's time. The crew remained faithful in spite of the down-pour of rain and the discomfort caused by the water and mud which came over their boot-tops. A great part of the equipment was saved. Those who remained on the knoll had to be taken off the next day in a boat.

In the latter part of January the river was still 26½ feet which is considered very high. The company were anxious to complete a two mile gap in the levee and not only failed to do this but lost a considerable amount of work that had been partly finished. The machines can only be reached at the present time by boats.

Misses Don't Count.

Two Irishmen arranged to fight a duel with pistols. One of them was distinctly stout, and when he saw his lean adversary facing him he raised an objection.

"Bedad," he said, "I'm twice as big a target as he is, so I ought to stand twice as far away from him as he is from me."

"Be aisy now," replied his second. "I'll soon put that right."

Taking a piece of chalk from his pocket, he drew two lines down the stout man's coat, leaving a space between them.

"Now, he said, turning to the other man, "fire away, ye spalpeen, and remember that any hits outside those chalk lines don't count."—*Chain Belt.*

A small boy and just as small a girl were out playing with a neighborhood dog. "You can see he doesn't like to play with you, Nancy," said Johnny, "because, you see, he's afraid I'll lick him if he hurts you."

Digging a Railroad Cut With a Dragline Excavator

THE dragline excavator is still little understood by engineers and contractors in general, indeed those even who have used this machine for some time are daily discovering therein new possibilities. Only a few years ago it was thought possible to dig only roughly to grade and to slope with a steam shovel, while now a steam shovel operator who cannot carry an even grade and cut a clean slope is not wanted at all.

Even at this late day few will think it possible to excavate with a dragline a railroad cut seven to twenty feet in depth, twenty-eight hundred feet in length, on a curve its entire length, and composed of the hardest kind of clay and hardpan, and furthermore, to do the job in such a manner that not one iota of hand work would be necessary on the slopes,the grade only needing to be leveled up with material from the ditches. Yet this is exactly what has recently been done by the Essex Construction Company, with a Class 14 Bucyrus machine on the Lorain, Ashland and Southern Railroad near Wellington, Ohio.

Figure No. 1 shows the cut as left by the dragline before any further work had been done. The machine did this work from the top, backing away from the cutting. The material, as shown, was wasted alongside.

Figure No. 2 is a nearer view of the same, showing tooth marks in the hardpan bottom. The machine in this picture has moved away from the cut to grade a highway approah.

Fig. 1 Railroad Cut as Left by Dragline Excavator. Lorain, Ashland & Southern Railroad. Essex Construction Co., Contractors.

Figure No. 3 is the same, showing grade after the material from ditches has been filled in the tooth-mark holes and leveled off.

The bucket used was the regulation Bucyrus two yard bucket with four teeth.

The operator who has so successfully learned the trick of sloping with the dragline while the machine is "a-straddle" of the cut is D. J. Ferry who has been practicing the art with a Bucyrus machine for about two years.

Fig. 2. Near View of Cut, Showing Tooth Marks of Dragline Bucket.

Fig. 3. The Cut After Material from Ditches Had Been Filled in the Tooth Marks.
RAILROAD CUT ON LORAIN, ASHLAND & SOUTHERN R. R., WELLINGTON, OHIO.
CONSTRUCTED BY A DRAGLINE EXCAVATOR.

Construction Work, South Eastern Drainage District, South Australia.

FOR several years work has been in progress upon the drainage project in the South Eastern Drainage District of the State of South Australia. Until recently, however, the methods and machinery employed have been very primitive and consequently progress has been slow. In the latter part of 1912 modern machinery was purchased and work started along modern and progressive lines.

The District comprises an area of nearly 2,000,000 acres of land which might be divided roughly into three classes: First, good pasture land, suitable for agriculture; Second, fair pasture land which will be benefited by drainage, and thirdly the very inferior land at present practically worthless.

As shown in our map the first and third classes are about equal in extent. This land requires an elaborate system of drainage in order to afford a proper utilization of the land.

At the present time the system is complete only for a small area in the vicinity of the Township of Millicent. The remainder is well under way.

The varied nature of the problems encountered and of the materials handled has made the work very interesting indeed. The differing character of the conditions renders the greater part of the work unsuitable for modern excavating machinery.

Under the direction of Graham Stewart, Engineer in-chief and F. N. Burchell, Superintending Officer of the district, modern machinery, consisting of a Bucyrus class 14, 1½ yard dragline excavator, an Austin excavator, two Ruston & Proctor 17 ton steam navvies and a Priestman crane, have been installed.

In a recent letter Mr. Stewart gives a very complete description of the District, indicating how the project has been laid out and planned, and how he has succeeded in effecting a saving of time, labor and expense in a recent change in his plans. In commenting on the work of the new machinery, Mr. Stewart says in regard to the Bucyrus dragline excavator: "The machine has done it's work well and including all charges the cost was under one shilling (about 25c) per cubic yard. The other machines used on these works comprise English steam navvies, a Priestman's crane, and a Type "R" Austin excavator, but owing to the variation in the class of material dealt with in each case and other circumstances, no useful comparison can be made between the various machines."

We print Mr. Stewart's description below:

Description of Scheme

The class 14 Bucyrus dragline excavator has been used on Drain C. The drain is 4 feet to 6 feet in depth and 19 miles long, necessitating about 309,000 cubic yards of excavation. As will be observed from the map, this drain is a considerable distance from the railway, which involved considerable expense owing to the difficulty in obtaining stores, making small repairs and in the original transportation of the machine.

Class 14 Bucyrus Dragline in Action.

The material which was handled was for the most part stiff clay, which as mentioned before was accomplished at a total expense of under one shilling per cubic yard.

A Priestman grab excavator was also used on this drain.

On the accompanying plan proposed drains are shown by solid lines, lettered A to M, and may be briefly described as follows:—

Drain A, same as Drain 1 in original scheme, to drain the Western portion of Dismal Swamp to the the head of Bakers Range Main Drain. Outlet discharge 20 cubic feet per second, which may be modified if underground drainage is found practicable.

Drains B, C, and D, are proposed to replace the drain in the original scheme. The following are the details:—

B. The improvement of the existing drain along the Penola and Robe road by deepening where necessary and making an extension at each end. Outlet discharge 180 cubic feet per second.

C. A drain from the Rocky Castle Swamp via Maoope to about Section 78 Hundred of Coles. Outlet discharge 200 cubic feet per second.

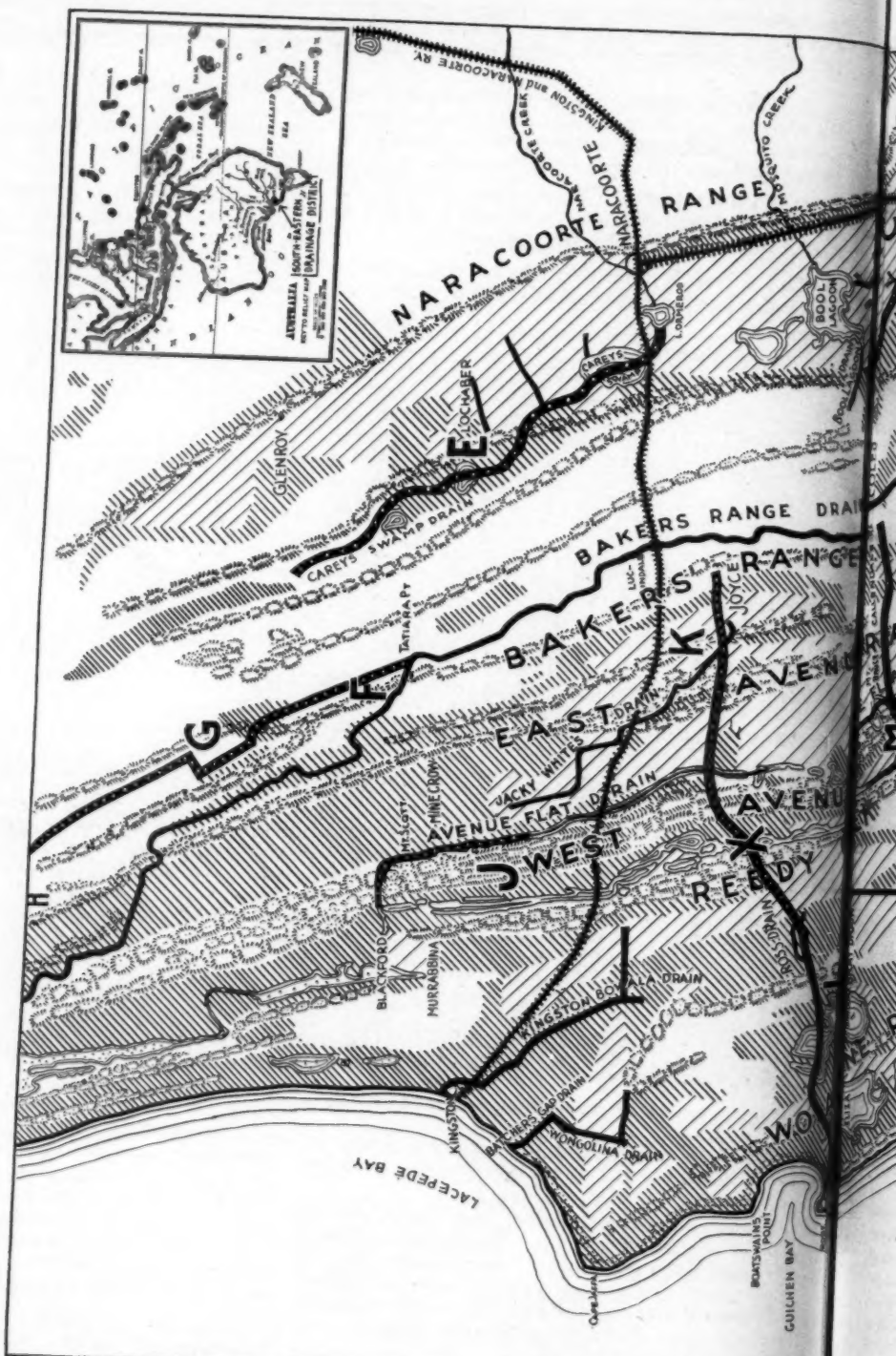
D. A branch drain from Rocky Castle Drain along the Eastern boundaries of the Hundreds of Killanoola and Monbulla, to near the Penola and Robe Road. Outlet discharge 40 cubic feet per second.

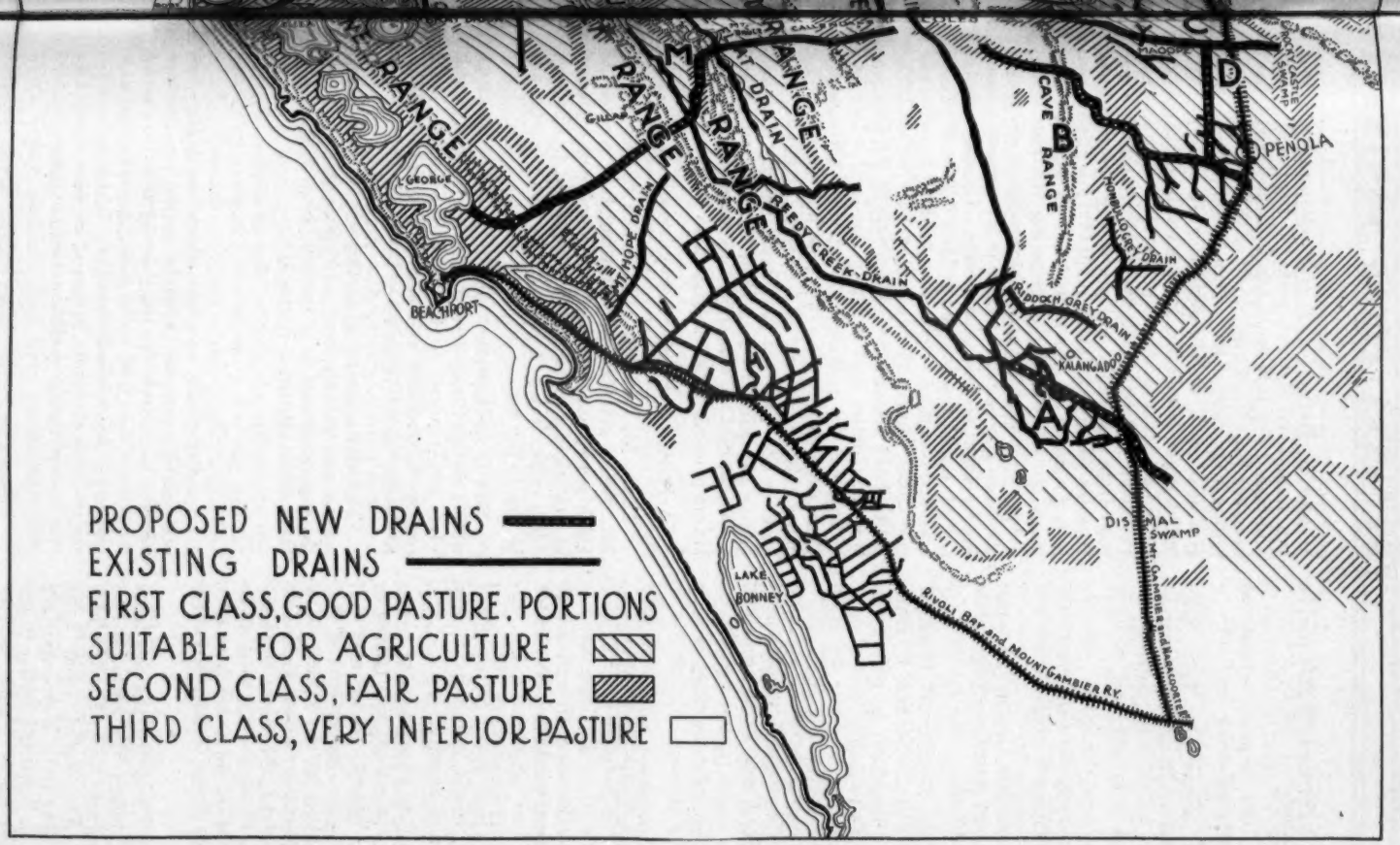
Class 14 Bucyrus Dragline Excavator on Drain C, South Eastern Drainage District, South Australia.

These Drains will relieve the upper country East of the railway, reduce the percolation through the porous strata on to the lower country West of the railway line, and provide an outlet for further subsidiary drainage. The floodwaters flowing North-westerly past Glenroy in the direction of Bool Lagoon will also be cut off.

Drain E of the Maracoorte Creek diversion, has an outlet discharge of about 500 cubic feet per second. As the complete diversion of the Naracoorte Creek in a westerly direction on to the Heath and thence into Bakers Range Drain would necessitate the excavation of upwards of 1,000,000 cubic yards of material, it is proposed instead of this to improve the existing water course from Lake Omerod to Garey's Swamp and made a drain through the range near the northern end of the swamp to the existing Lochaber Valley Drain near Section 128 Hundred of Lochaber, which will be widened, deepened, and extended sufficiently to discharge the ordinary winter flow of Naracoorte Creek as well as local drainage. This drain will not be large enough to take all the water when the Naracoorte Creek is in extreme flood but will lower it quickly after the flood subsides, and provide a good outlet for the local drainage.

Provision has also been made for deepening the existing drain between Garey's Swamp and Section 128 Hundred of Lochaber, so as to cope with local


NARACOORTE RANGE
NARACOORTE
GLENROY
CAREYS SWAMP DRAIN
BAKERS RANGE DRAIN
BAKERS RANGE
EAST DRAIN
AVENUE FLAT DRAIN
JACKY WHITES DRAIN
WEST DRAIN
BLACKFORD
MURRABBINA
KINGSTON BOWALLA DRAIN
WORGOLINA DRAIN
LACEPEDE BAY
BOATSWAINS POINT
GUICHEN BAY
BOOL LAGOON
MOSQUITO CREEK



Map of the Southeastern Drainage District, South Australia. Showing the Existing and New Drains, and the Districts They Are Designed to Drain.

water and water from the Naracoorte Estate Lands, which at present has no outlet.

The drain known in the original scheme as No. 4 is to be replaced by the following:—

F. An embankment across the Gap near Tatiara Point to divert Bakers Range Drain northwards into poor country which will probably be improved by flooding and is in any case of little value at present.

G. Enlarging an opening in the valley north of Bin Bin, to allow for floodwaters flowing northward.

H. An embankment across a Gap in the range east of Kercoonda, to prevent water entering Cattle Station Creek and Reedy Creek.

J. A shallow drain from Section 147 Hundred of Minecrow, via Mount Scott to Section 11 Hundred of Murrabinna near Blackford, to relieve the lower portion of Avenue Flat.

K. A drain for the diversion of the headwaters from the Joyce, St. Helena, and Avenue Flats, discharging 250 cubic feet per second into the proposed main Drain L from Reedy Creek to the sea near Robe.

These alterations are proposed for the following reasons:—

The drains originally proposed would be very costly owing to the large quantity and hard character of the excavation.

The proposed outlet to the sea with a discharge of 2,800 cubic feet per second would not provide for a maximum flood.

The bulk of the land which would be benefitted is of poor quality, and would not warrant the expenditure of a large sum of money.

The two main drains marked L-K, and M on the map are so placed as to be of the greatest benefit to the flats west of Bakers Range Drain, and will admit of extension to the upper country east of that drain should this be required in the future. The proposed drain from Robetown to near Lucindale (L-K), could be made to take the water from the Naracoorte and Mosquito Creeks, while that from Beachport to Callendale (M) could be made to take the drainage of the country in the vicinity of Penola and Kalangadoo.

Drain L from Reedy Creek to the sea near Robetown is intended to replace the lower portion of the drain in original scheme (from Reedy Creek to Boatswain's Point). The outlet from Lake Hawden north to the sea near Robe is an important one, but may be difficult to construct owing to the running nature of the wet sandy ground west of Woakwine Range. The only alternative routes, viz, from Lake Hawden north to Boatswain Point, and from Lake Hawden south to Lake George, have been carefully examined, and found to compare very unfavorably with the adopted route from Lake Hawden north to the sea near Robetown. The outlet drain from Lake Hawden will discharge 700 cubic feet per second, while the combined flow into the lakes will be about 900 cubic feet per second (650 from the drain and about 250 entering Lake Hawden south from other points.) For the present it is proposed to use both lakes as an equalizing basin for the purpose of reducing the size of the drain to the sea, but as the water will pass off quickly the basin can be made available for summer pasturage by slight additional drainage. Complete drainage of Lake Hawden south (said to be extremely good land) can be attained by banking between the two lakes, diverting the water now entering the South Lake around the eastern side of the lake into the main drain, and draining the local water into Lake Eliza by cutting or tunnelling through the Woakwine Range. No provision has been made for doing this at present, as I consider it advisable to observe the result of the work already proposed before anything further is done. No suggestion is made for the complete reclamation of Lake Hawden north which is known to be poor ground.

A Ruston & Proctor navvy is used on this drain.

Drain M, from near Callendale to the sea, via Mt. Bruce and Gillap, is intended to replace old Drain 6 and also the upper portion of former Drain 5 in the original scheme, and is designed to discharge 1,000 cubic feet per second into Lake George and thence to the sea.

This is an important drain, cutting off the head waters of the Reedy Creek, Avenue, and Callendale Flats which largely contribute to the flooding of the country to the north and west. The second Ruston & Proctor navvy is used here.

The total quantity of earthworks in the amended scheme amounts to about 5,100,000 cubic yards, and the estimated cost is £339,000 being £39,000 over the amount provided in the Act.

A certain country merchant after several inquiries from customers for a goose iron (which, by the way, is an attachment belonging to a blacksmith's forge) decided to lay in a stock of one dozen of these irons for his trade. In making out his requisition to the wholesale merchant, he became somewhat confused as to the correct wording of his order; to say 1 doz. geese irons he thought would not sound just right, so writes his order as follows:

1 Goose Iron, send also eleven more just like it.—*Yarns.*

The Excavating Engineer

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Bradlee Van Brunt, Manager and Editor

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Construction Outlook.

Business conditions during the past month have shown a steady improvement. Money conditions are more favorable for commercial expansion. Manufacturers in all lines are busier. Business is not booming, but a spirit of optimism seems to be abroad which is in direct contrast to the feeling two months ago.

About this time in the year there is apt to sprout up a harvest of rumors of prospective railroad construction. Although such rumors are not clogging the news columns at the present time, a fair number have made their appearance. One of the larger western lines is reported to be preparing to call for bids on a 250 mile extension; the Soo line have decide to make a 65 mile extension sometime during the coming summer; the Southern Railway will do 20 miles of double tracking; an official of the Eureka-Nevada Railway announces a 14 mile extension and the Alabama Great Southern and the Burlington are said to be planning 90 miles each of double tracking and cut-off.

A few railroad contracts have been awarded, none of them large, however. Guthrie, McDougall & Co. have 65 miles in British Columbia on the Kettle Valley Railroad and some weeks ago The Atlantic Coast line let 60 miles of main line in North Carolina. Some of the eastern states, notably Maryland, Connecticut and New York show considerable activity in road construction and street paving.

Drainage work has not been as active, but the prospects are favorable for a large amount of work in the near future.

The question of the raise of freight rates is still in the balance. The Interstate Commerce Commission has ordered a further suspension for six months. Although this suspension may last until September it is said by members of the Commission that by April or May a decision would be given as to whether or not the proposed rates should be allowed to go into effect. The fact that the Commission is conducting a collateral inquiry into the free service and allowances given by railroads to favored shippers, has given rise to considerable apprehension in railroad circles as to a favorable outcome.

A further indication of the attitude of the investing public towards the railroads is shown very clearly by the statistics compiled soon after the first of the year by the Railway Age Gazette. For the last three years the milage of new line has remained at an extremely low figure—3071 miles of first track were built in the United States in 1913. This is 74 miles more than 1912 and 5 miles greater than 1911, but except for these years, lower than any year since 1897.

Railway men and the investing public are hesitating more and more before venturing the construction of lines into undeveloped territory. This is the direct result of adverse legislation. Public opinion has proved the strongest weapon known for ferreting out unhealthy conditions that exist in business. Unhealthy conditions have existed and doubtless still exist in some instances. Those that remain will be brought to light in due time. But the question remains, will public opinion demand a reasonable return of confidence in the greatest arteries of our prosperity, the railroads?

Texas has for the past few years led the country in new construction. The decline in the milage here is due directly to the radical legislation in this state. As long as present conditions continue to exist there can be no other effect than that shown by this decreasing construction which has led to the postponement of the development of new territory now devoid of railway possibilities.

When a new man comes into your camp do you ever ask him what he knows? Doubtless your new superintendent or your new runner has told you a few things, when things were not going to his liking. Perhaps you took this remark in and perhaps you did'nt. As a matter of fact that superintendent or engineer, or your new foreman or even someone

from that new pit gang, has been working under a system a bit different to yours and has carried with him a germ of an idea, which if allowed to germinate in your brain might produce big results on your contract. Your method may be better but you can never tell what you can find until you search for it. Many big ideas, money producers, have emanated from hints pried out in such a manner.

The Quitter.

When you're lost in the Wild, and you're scared as a child,
And Death looks you bang in the eye,
And you're sore as a boil, it's according to Hoyle
To cock your revolver and....die.
But the code of a Man says: "Fight all you can,"
And self-dissolution is barred.
In hunger and woe, oh, it's easy to blow....
It's the hell-served-for-breakfast that's hard.
"You're sick of the game!" Well, now that's a shame.
You're young and you're brave and you're bright.
"You've had a raw deal!" I know, but don't squeal,
Buck up, do your damndest, and fight.
It's the plugging away that will win you the day,
So don't be a piker, old pard!
Just draw on your grit; it's so easy to quit:
It's the keeping-your-chin-up that's hard.
It's easy to cry that you're beaten—and die;
It's easy to crawfish and crawl;
But to fight and to fight when hope's out of sight—
Why, that's the best game of them all!
And though you come out of each gruelling bout,
All broken and beaten and scarred,
Just have one more try—it's dead easy to die,
It's the keeping-on-living that's hard.

—*Robert W. Service.*

REVIEW OF BOOKS and CATALOGS

We shall be glad to review in this column such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the prices named.

SMITH MIXER—Catalogue No. 300, 6″ by 9″, 63 pages and cover. In this new catalogue the T. L. Smith Company describe and illustrate in a very effective manner the improvements and the new types of machines which they have recently put on the market. The first part of the catalogue points out by very effective illustrations the various talking parts of their mixers, such as the double conical shape of the drum, the gravity discharge the power dump etc. Since the publication of their last catalogue a number of important improvements have been made which are here dealt with. The water tank is now enclosed and equipped with an air valve and a three-way inlet and outlet valve, as well as a gauge glass. An improved power tilt is another interesting feature. The Smith side loader has also been considerably altered and improved. The new Smith "Mascot" mixer which is a light weight portable machine is dealt with, as well as the Smith side-gate car.

The Smith Company have also re-numbered their mixers as follows:—

New No. of Mixer	104	106	110	113	117	122	131	140	162
Old No. of Mixer..	Mascot	10	11	New	12	13	14	16	18

The T. L. Smith Co.,
Milwaukee, Wis.

AIR COMPRESSOR EFFICIENCY: A pamphlet 6 x 9″, 8 pages, paper cover, dated January 1914. A short statement of the factors which control air compressor efficiency with a description of the Cincinnati air gear.

The Laidlaw-Dunn-Gordon Co.,
Cincinnati, Ohio.

OBJECT LESSON AND EXPERIMENTAL ROADS AND BRIDGE CONSTRUCTION, 1912-13. Bulletin No. 53, U. S. Department of Agriculture, 6″x 9″, 36 pages, paper cover. A report on experiments and investigations carried on by the U. S. Office of Public Roads during the years 1912-13 in order to determine the best methods of road building and the best kinds of road making materials. The following subjects are treated and reported upon: Bituminous—Concrete road; Bituminous—macadam road; Macadam roads; Gravel roads; Gravel—macadam roads; Brick—sand roads; Sand—clay roads; Sand—gumbo roads; Shale roads; Earth roads. A report is also given on bridge work during the above mentioned years.

U. S. Dept. of Agriculture,
Washington, D. C.

THE DRILL HAMMER: 3¾″ x 7¼″, 16 pages and cover, setting forth the advantages of the drill hammer for drilling concrete stone and other materials formerly handled with a cold chisel, drill and hammer. Fully illustrated.

Orr & Lockett Mfg. Co.,
14-16 West Randolph St., Chicago, Ill.

SECOND-HAND CONTRACTORS' EQUIPMENT. Stock bulletin No. 167, listing various contractors' equipment on hand, including locomotives of various gauges, boilers, air compressors, engines, pipe, piling, pumps, relaying rails, tanks and miscellaneous equipment.

Walter A. Zelnicker Co.,
St. Louis, Mo.

SECOND-HAND EQUIPMENT. A list of second-hand machinery for sale, including air compressors, boilers, blowers, condensers, direct connected sets, engines, hoisting engines, gas engines, heaters, motors, pumps, planers, steam shovels and miscellaneous equipment.

The Machinery Warehouse,
3701 So. Ashland Ave., Chicago, Ill.

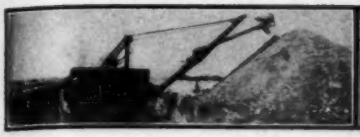
STORAGE BINS—Catalogue 6½″ by 9¾″, 26 pages and double cover. A beautiful illustrated and printed description of the Baker Patent Suspension Type Storage Bins. The various types of bins are illustrated both by photographs and sketches, the following types being featured: The concrete lined coal bunker for boiler coal and ashes, the unit slab type for heavy non-abrasive materials, the wood lined bin, the steel plate bin of the light weight beam girder type for finely divided or medium weight material such as sand, crushed stone, finely divided ores, etc., and the heavy steel bin for heavy materials such as the large sizes or ores, stones, etc.

In the rear part of the catalog, the more important 1913 installations of stock trestles and storage bins are illustrated

Arthur K. McKee,
Contracting Engineer,
Cleveland, Ohio.

T. F. STROUD & CO.—Catalog No. 15, 7½x10½ inches, 28 pages and cover, describing and illustrating the full line of products manufactured by the above concern, consisting of the Stroud steel frame elevating grader, the "little red wagon," wheel, drag, buck and tongue scrapers, various types of the Stroud reversible road machines and ditchers, adjustable road drags, dump cars, wagons, bucks, etc.

T. F. Stroud & Company,
Omaha, Nebr.

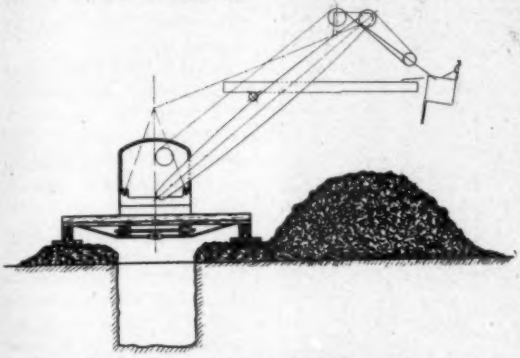


FIELD NOTES

DISCUSSION IS INVITED FROM MEN IN THE FIELD ON SUBJECTS HERE PRESENTED

Economizing in Space in Digging a Shallow Sewer

Contractors are frequently confronted with the problem of digging a sewer in a narrow street, where the conditions require that the spoil be deposited entirely on one side in order to leave the other side free for traffic or for the materials for the laying of the conduit or pipe. In such a case it is assumed that there is little surplus material after the back fill is made, the trench being approximately 10 feet wide by 3 or 4 feet deep.



A method of procedure which has several times been practiced with success is as follows:

When the trench is started, build a runway for the shovel from the excavated material about 2 feet high on either side of the trench, as shown in the sketch. This has a two-fold advantage; it economizes in space by taking care of a part of the excavated material and it serves as a dike which will permit the spoil to be dumped nearer the shovel, and higher than would otherwise have been possible.

In order to accomplish this successfully it should be remembered that the material must be firm, either stiff clay, hard pan, shale or blasted rock.

Safety Rules for Storing and Thawing Explosives.

The following rules have been taken from the Inland Steel Company's book of rules:—

(1) A magazine shall be provided for the storage of high explosives where more than a supply to last 72 hr. is kept on hand.

(2) This magazine shall be not less than 300 ft. distant from the shaft, adit, habitation, public highway, public railway, thawing house, or mine buildings. Where the distance between magazine and thawing house is less than 1000 ft., a barrier should be provided.

(3) The magazine should be provided with a ventilator at the roof, should have matched flooring, and shall be lighted from the outside only. The presence of any form of light or fire within a magazine is prohibited. Where steam or hot-water heat is used, wooden grates should be provided to prevent explosives coming in contact with hot pipes.

(4) A thermometer should be provided in magazine and thawing house.

(5) The magazine shall be waterproof and covered with a fireproof and bulletproof material.

(6) A lightning conductor supported on a vertical post standing clear of the magazine and not nearer than 18 in. to one of the walls thereof and rising at least 6 ft. above the highest point of the magazine should be installed. It should be carried to a properly laid earthplate, set in the ground below the permanent moisture line of the ground and at a distance of at least 1 ft. outside the walls of the magazine.

(7) "No Smoking" signs and "Dynamite" signs shall be placed on all magazines and thaw houses.

(8) All thawing of dynamite should be done in one of two ways: In a properly constructed thaw house by approved methods; or in a water-tube heater by means of warm water, no hotter than the bare hand can stand. Direct heat is not permitted.

(9) In all places where more than 100 lbs. of dynamite or other high explosive is used daily, a thaw house shall be erected for this purpose. The heating apparatus of the thaw house shall be so arranged that the temperature cannot rise higher than 80° F. even if neglected.

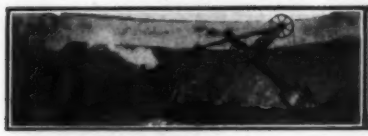
(10) Where small amounts of dynamite are used, the thawing shall be done in a water-tube thawer.

(11) The thaw house may be heated only by hot water, steam or exhaust steam.

(12) Drawers in thawers should be changed at least once a year and oftener if they show signs of being saturated with nitroglycerin.

(13) It is forbidden to thaw dynamite on heated stoves, rocks, brick, metal, in an oven, near a steam boiler or fire, over steam or hot-water pipes or by any other method than those provided for above.

(14) While thawing, high explosives are extremely sensitive and should be handled with great care.



DEVICES YOU OUGHT TO KNOW ABOUT

Something New in the Traction Train Line.

The Eagle Wagon Works of Auburn, New York, exhibited with their regular Dump Wagon at the Good Roads Show in Philadelphia, a two wheel trailer carrying crushed stone or other material to be hauled behind a traction engine or auto tractor. This trailer consists of a number of two wheel carts or cars, so connected that they are perfectly flexible, accomodating themselves easily to the contour of the road. They are so simple in construction that a 2 or 3 yard wagon or car can be furnished much cheaper than the big four wheel cars. and of course they are much lighter and easier of draft.

A Train of Eagle Trailers.

The body of these cars or carts is made of steel as are the wheels. These wheels have wide, eight inch tires, enabling them to carry the load without cutting ruts into the road. They are provided with roller bearings, mounted on straight steel axles which gives a much more durable and easier running conveyance than can be had where the pivot axle, or even where a plain axle is used without the roller bearings.

These cars have gone through the experimental stages, indeed the several trains which have been in operation during the past summer have given excellent reports regarding this utility, durability and general fitness. In order to prevent them from tipping and to keep the train steady so that each car or cart follows the preceding one, the coupling has been made very simple and ingenious. The picture shows a train of eight of these carts making a sharp turn in the road. Four of them are of 3 yard capacity and the rest 3½ yard capacity. The draft is very light owing to the flexibility of the train, the roller bearings of the wheels, and the general simplicity of the entire outfit.

The Economy of Oxy-Acetylene Welding to the Shovel or Dredgeman

Railroad contractors, dredgemen and other engaged in contract work are not as familiar with the Oxy-Acetylene process for welding and cutting as they should be. The advantages are all too obvious to anyone who has made investigations, as these advantages can not only be demonstrated by figures that talk, but by actual tests.

An Oxy-Acetylene outfit, on the ground, will serve to protect a contractor against the danger of being held up on an important job by the breakage of a vital part on a shovel or locomotive. Inferior devices have been introduced in the past, which have resulted in creating an adverse sentiment in some quarters. Such failures have always been traced either to bad equipment or more frequently to the lack of knowledge of the proper application on the part of the operator.

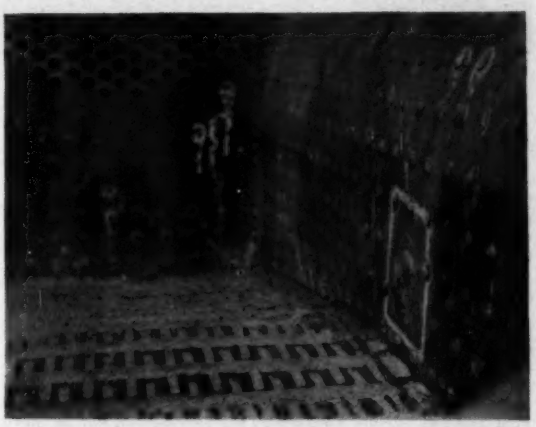
The Oxy-Acetylene method of welding is a trade in itself, but one that can be readily mastered by any intelligent man skilled in metal work. The Oxweld

Locomotive piston rod worn at the crosshead fit, built up and made serviceable at a cost of $3.00. A new road would have cost between $12.50 and $18.00.

Acetylene Company of Chicago, one of the foremost manufacturers of Oxy-Acetylene outfits, is in the habit of sending out competent men to instruct in the proper method of operation.

Railroads have for the past few years been making extraordinary records of economy. We print below a few figures which should be of particular interest to shovel men. This demonstration was made in the shops of the St. Louis and San Francisco Railway at Springfield, Mo., with an outfit made by the Oxweld Acetylene Company of Chicago.

The range of work applicable to this process is very wide. Besides welding miscellaneous forgings and bars, cracks in boiler sheets, plates and structural work may be welded most economically.



Crack in a fire box repaired with an Oxweld Welding Blowpipe.

WORK DONE AT ST. L. & S. F. RAILWAY SHOP SPRINGFIELD, MO.		COST OF DOING WORK WITH THE OXWELD PROCESS					COST OF DOING WORK BY BEST OTHER METHOD		
Date	Description of Work	Oxygen at 3 cents per Cu. Ft.	Acetylene at 1 cent per Cu. Ft.	Iron Filler	Labor and Cost of Preparing Work	Total	Labor and Material	Total	Saving
4-26-12	Crack 14 inches long in new door sheet. Had not been put in fire-box	20 cubic feet .60	12 cubic feet .12	¼ pound .03	Welder 45 minutes; boiler maker, 1 hour .70	1.45	1 boiler maker and helper patching, 24 hours	14.40	12.95
4-27-12	Main rod cracked in slot of jaw	20 cubic feet .60	12 cubic feet .12	¼ pound .03	Welder, 30 minutes; chipping and preheating, 45 minutes .50	1.25	Forge weld on machine and drill new jaw, 12 hours	10.00	8.75
4-28-12	Eight cracks in side sheet of firebox averaging 3 inches long each, engine 552	24 cubic feet .72	15 cubic feet .15	¼ pound .03	Welder, 1¼ hour; chipping, 1½ hour 1.10	2.00	1 boiler maker and helper, 8 hours plugging	4.80	2.80
4-30-12	8 inch crack in door sheet of firebox on Engine 1003	8 cubic feet .24	5 cubic feet .05	¼ pound .03	Welder, 15 minutes. Boiler maker, 10 minutes .15	.47	1 boiler maker and helper 20 hours patching	12.00	11.53

SHOTS FROM THE FIRING LINE

Alabama

Birmingham—R. H. Price is operating a 70 ton Bucyrus shovel for C. G. Kershaw Contracting Co. at Thomas, Ala.

Bridgeport—Construction work on the double track of the Nashville, Chattanooga & St. Louis Railway between Bridgeport and Bolivar, Ala., is being actively pushed, after a suspension of three months. George Hurd is superintendent of the Dixie Contracting Company, which is doing the work.

Birmingham and Vicinity
By R. S. Byron

Reports from J. C. Carland's work on the L. & N. at Lewisburg, Tenn. indicate that they certainly are moving the material with their Bucyrus 85-C shovel.

Levee work below New Orleans that was to be let on February 9th was not awarded as the bonds could not be taken care of. The work will most likely be readvertised.

W. H. Dankert is now running an 18-B Bucyrus machine for J. D. Cranford at Tellico Plains, Tenn. This machine is used for building a dam for an artificial lake for a large summer resort.

The Copeland-Inglis Shale Brick Co. of Birmingham have just installed a Little Giant shovel at their plant with which to do the stripping. They have been operating a 70-C Bucyrus shovel to dig their clay with. Mr. Nostrant is operator on these machines. Mr. Swartz is superintendent of the work.

J. T. McCarthy reports that everything is moving along nicely with their G. F. & A. railway work at Monroe, Ala. He states that their 60-C Bucyrus is certainly moving the dirt and his estimates verify this statement. Mr. McCarthy will certainly be glad when he gets his new 70-C Bucyrus shovel to work which he expects will be in the next few days. There is no reason why the dirt should not fly with Dan Downey in charge of the work.

Bids were opened by the Garland Levee Board of Texarkana, Ark., on February 5th for constructing 25 miles of levee on west bank of Red River. Bids were as follows: Constant & Jackson, 16.40; Douglas, George & North, 17.18; Dennison & Rogers, 18; J. A. Nicholson, 18.47; Lacy & Chisard, 17.80; Geo. P. Wright, 16; S. R. Hughes, 18.50; Roach & Stansel, 19.24; M. A. Wogan, 15.40; Conway Bros., 19.75; R. H. & G. A. McWilliams, 14.74, awarded contract. McWilliams also bought the bonds at $185,000. McWilliams & Co. will start work at once and will use two or three draglines on this work.

The contractors in the south have been experiencing very fine weather for the past three months and the few that are at work are making good use of the nice weather.

The many idle contractors in the south are beginning to wear a little smile on their faces as recent reports indicate that the A. G. S. & L. & N. will do some more double tracking. The southern contractor is due several smiles for they have been dormant for the past six months.

Arkansas

Piggott—The contract for 666,000 cubic yards of levee and ditch excavation, 59,000 cubic yards of borrow pit refill, etc., was awarded February 10, 1914, to A. V. Wills & Sons, Paragould, Ark. C. B. Bailey, Wynne, Ark., engineer.

California

San Diego—John Engebretson has been awarded a contract by the San Diego Electric Ry. Co. for grading the roadbed of the Park Line. A. Ervast is chief engineer of the railway.

Notes from Los Angeles
By G. H. Hutchinson

Sharp & Fellows Contracting Company were low bidders for about two and a half miles of road work in Orange county. This work consists of about 63,000 yards of excavation.

Lee Moor of the Lee Moor Construction Company was in Los Angeles a few days last week and has returned to his home in El Paso, Texas.

James Broderick, the smiling secretary of Sharp & Fellows Contracting Company, was married in San Francisco on Feb. 17th, and has gone to Honolulu on his wedding trip. We congratulate Mr. Broderick and his bride, who will later take up their residence in Los Angeles.

Messrs. Sullivan, Gabler & Kautz of Los Angeles have just purchased an 18-B Bucyrus shovel from Norman B. Livermore & Company, 1206 Hibernian building, Los Angeles, and expect to enter into the contracting game.

They say you cannot make a Dutchman out of an Irishman, but since Mr. Wm. Gallagher attended the banquet at Sunset Inn, Santa Monica, in honor of the Kaiser's birthday, he has shown a tendency to "Hock the Kaiser" and has shown a decided preference for German brew, and dishes favored by that nation. He was chaperoned on this festive occasion by his friends Chris. Kaehler, Henry Mechelke, M. Carstausen, Joe Moncofkey and Dr. C. Trummer.

Gallagher is stuck on the Dutch,—he says when two Dutchmen get into an argument, if one calls the other a liar they jump up to fight as all people do, then a couple of their friends run in between and pacify them, and then they all sit down and have a glass of beer and everything is forgotten; but at an Irish picnic if an argument comes up and one Irishman calls another a liar, that is your cue to climb a tree because nothing will settle the matter but gore.

Canada

News from the Welland Canal.

Mr. and Mrs. Tom Poole are now in St. Catharines. Tom Poole is operator on a class 20 Bucyrus dragline excavator owned by Yale & Reagan. The machine has not as yet been erected as the weather has been very cold.

Mrs. Poole advises us that the price of "Prince Albert" is prohibitively high in this district.

Yale & Reagan have part of Section 2 on the Welland Canal which consists of one million and a half yards of excavation. They will load the material into cars with a 70-C Bucyrus shovel and a class 20 Bucyrus dragline. The shovel is now in operation but the dragline has not as yet been erected.

Charlie Linch is operating the shovel and John Linch is craning it.

The Dominion Construction Co. have 300 men employed on section 1 and Yale & Reagan about 60 on section 2. Both have very complete camps.

In our February issue we published a note to the effect that the Dominion Dredging Co's 85-C shovel had recently been given its first try-out on Section 1 of the Welland Canal. It was reported that the shovel excavated at the rate of 1000 yards for the first day. We understand now that on the first day's opera-

tion this machine excavated 2,736 yards, working seven hours and loading into trains of four and five cars We understand that it could easily have done better. The material was extremely hard digging.

J. G. Beck is erecting a class 20 Bucyrus dragline excavator for Yale & Reagan on their Welland Canal contract. Mr. Beck has just completed the erection of a new class 24 Bucyrus dragline for the Dominion Dredging Company here.

Halifax, N. S.—The Cook Construction Company and Wheaton Bros., are making good progress on their big contract on the Halifax Ocean Terminal. They are using two 100-C Bucyrus shovels, working from either end of the contract. The photograph herewith shows one of the shovels at the Point Pleasant end of the work. It is interesting to note that after long series of tests the contractors are using Cyclone drills ahead of the shovels.

Vancouver, B. C.—The Canadian Pacific Ry., will construct the following lines during the coming year: Empress to Bassona, 140 miles; Golden to Ft. Steels, 70 miles; Monitor to Kerrobert, 75 miles; Alberta Central west of Red Deer, 35 miles; Weyburn-Lethbridge line west of Shaunayon, 90 miles; Gimli north 26 miles, and Coronation northwest 45 miles.

Montreal—The project for the joint construction by the governments of Canada and the United States of a deep-waterway for the ocean-going vessels from Montreal to Duluth, Minn., has been launched through the International Joint Commission which has the jurisdiction for the boundry waters of the two countries. The scheme for the ocean waterway for navigation from the head of Lake Superior to the Atlantic has been talked of for several years. Several routes have been proposed for the project the cost of which is estimated at from $100,000,000 to $300,000,000, but the one said to be the most favorable to the United States provides for the utilization of all the lakes on the St. Lawrence River.

Colorado

Denver—The San Miguel Development Company has completed surveys for a railroad to connect the radium ore fields of Colorado with the Denver and Rio Grande at Placerville. The road will be seventy-six miles long and cost $2,000,000.

District of Columbia

Washington—On February 18th the House of Representatives passed the Alaska railroad bill providing for the construction by the Government of a railroad in Alaska at a cost of thirty-five million dollars. The road is to be owned and operated by the Government and will tap the Bearing and Mantanuska coal fields. Inasmuch as the Senate has already passed a similar bill this action assures the carrying out of the project. If the amendments to the bill made by the House are accepted by the Senate, the railroad will be paid for by direct appropriations from the Treasury from year to year as fast as the funds are required. A million dollars has been appropriated with which to start the work.

Florida

Tampa—West Coast Construction Co. Box 1061, Tampa, has the contract for constructing the Tampa, Atlantic & Gulf Ry., a 230-mile line projected to extend from Tampa to Fort Lauderdale. Edward Walker, Tampa, is General Manager of the railway.

Georgia

St. Marys—It is being planned by the Atlantic, Waycross & Northern Railroad to construct at once 22 miles of railroad. D. C. Edwards, St. Marys, Ga., chief engineer.

Illinois

Chicago and Vicinity.

J. C. Parquette of Olin, Iowa, superintendent of Donald Jeffrey's outfit was in Chicago recently calling on friends. Parquette was looking fine and ready for business, having taken over the Covington outfit.

Louis Demick, the gentlemanly manager of the foreign labor department of 14 South Canal Street, returned from a month's stay at Hot Springs. "Some place," Louie says, "But, Oh you St. Louis!"

Frank McGillicuddy and John Clifford of Valparaiso, Ind. were callers in Chicago recently. Both are looking fine and ready for the opening of Spring. Frank is now at Dedham, Iowa loading the Green outfit.

J. A. McDougall of Minneapolis, Minn. was shaking hands with friends in Chicago February 9th. Mack is looking fine.

G. S. Hodges, County Commissioner of Sabula, Iowa was a pleasant caller recently. He is getting acquainted with Chicago business houses. Come again!

Geo. Maxfield of Toledo, Ohio, A. L. Blakesly of Kickapoo, Ind. and Edward Costello, Detroit, Mich. were calling on friends recently.

Geo. Tate, shovel foreman, has been in the city.

W. E. Long of Tampico, Ill, has been calling on friends in Chicago. Bill is as thin as ever, and putting in his time between the farm and the ditch he is digging.

Muddy—E. E. Headley & Son have a piece of ditch work amounting to seventy five or eighty thousand cubic yards suitable for dragline excavation to sublet, near Harrisburg, Ill. Address them at Muddy, Ill.

Chicago—Bids will be received until noon, March 12, by the Sanitary District of Chicago, Room 700, 900 S. Michigan Ave., for Section 11 of the Calumet Sag Channel of the district, including 750,000 cubic yards glacial drift excavation, 85,000 cubic yards solid rock and 70,000 square yards rip rap slopes.

Cairo—Mr. Jones of the Fred R. Jones Co. reports that he completed his levee contract shortly after January 1st, finishing the work in record time.

Iowa

Pocahontas—The contract for drainage district No. 77, 1,200,000 cubic yards, was divided between Lewis & Holdaway, Atwood, Ill., and E. D. Barr, Fieldon, Ill. Bids were opened February 10, 1914. W. B. Warrington, Pocahontas, Ia., is the engineer.

Kansas

Manhattan—The Manhattan City & Interurban Ry. Co., Joseph T. West, Manhattan, General Manager, will start work shortly on the line from Eureka Lake to Fort Riley.

Pittsburg and Vicinity

By W. S. Russell

The recent cold weather has stimulated the demand for coal and business has been brisk for the past three weeks. Prices are about the same as last month. We quote as follows: Lump, $2.25 per ton; Nut, $2.00 per ton; Mine run, $1.60 per ton; Slack, $1.35 per ton, F. O. B. cars at the mines.

There are now twenty-six coal stripping steam shovels working in the Pittsburg field, all of them running on full time, as there is a preference for strip coal, especially for commercial and domestic use, it being better graded and of a better quality than underground or shaft mine coal.

There are good openings for parties having means who may wish to engage in coal stripping, which is a very profitable business in the Pittsburg district. We know of several good fields of strip coal that may be secured either by lease or purchase The cost of a plant including steam shovel, tram cars, track, locomotive, tipple with shaker screens, engine, pumps, water pipe, etc., will vary from $30,000.00 to $50,000.00 part of which may be purchased on several months time. Communications may be addressed to the Pittsburg Machinery Co., No. 806 N. Broadway, Pittsburg, Kansas.

The Fleming Coal Co. are operating their new 190 ton Bucyrus steam shovel on their field at Skidmore and are very much pleased with it. Notwithstanding its great size and length of boom this shovel has a working speed of two dippers per minute and scoops up about four cubic yards of material at a lift. It is worth making a trip to see it.

The Nesch Coal Company are operating their new class 175-B Bucyrus steam shovel at Frontenac, stripping coal for the Santa Fe railroad. The shovel is making a box cut 90 feet in width and dumping the material all on one side. Superintendent Hammil is much pleased with its work.

The Moka Coal Co. of Pittsburg are operating their 150-B Bucyrus steam shovel stripping a 160 acre field a mile south of Mulberry. They run every day. Lee Bigley is superintendent in charge of the plant.

Packard and McWilliams are operating a model 250 Marion steam shovel stripping their field near Fuller, Kans. about 10 miles north of Pittsburg. They have recently installed a small revolving shovel for loading the coal, which is giving good results.

The Cherokee-Girard Coal Co. of Minden, Mo. have a fine coal stripping plant near Minden and have done exceedingly well since starting up last summer. The coal is of extra good quality and has a ready sale. Messrs. McFarland and Hubert are both practical men and give their business personal attention. We wish them continued success.

The J. J. Stephenson Coal Co. are stripping a 20 acre field of dead coal at north Pittsburg with a model 250 Marion steam shovel. The overburden is about 24 feet deep, coal 3 feet thick.

We met Carl Cockrill, manager Besse-Cockrill Coal Co. on Broadway the other day. He was in a big hurry but stopped long enough to tell us that he was working his model 250 Marion steam shovel every day stripping their coal field near Weir City, Kansas.

J. J. Stephenson has returned from Excelsior Springs greatly improved in health. He says he is feeling fine.

R. J. Lawrence, mining engineer of the Carney Coal Co. is prospecting a new strip coal field in the Pittsburg district.

E. E. Laughlin of Rich Hill, Mo. was a recent visitor at Pittsburg looking over the coal stripping operations.

The Bucyrus Company are now building a steam shovel of the revolving type, especially designed for loading coal from the pit into tram cars. It is claimed that this steam shovel will effect a considerable saving in this operation. This shovel will be ready for delivery the first part of March.

The Pittsburg Machinery Co. are now located in new quarters at No. 806 Broadway, just above the Stilwell Hotel. They have rented an entire store building and have in a large stock of coal miners and contractors' supplies, tools, etc. They also handle all kinds of mining machinery, also repairs for Bucyrus shovels and are doing a nice business.

Kentucky

Hickman—G. R. Hurd, superintendent for the Dixie Contracting Company at Nashville advises us that he finished his contract here on the 5th of February and returned to Bridgeport, Ala. to complete the double track work which he left last Fall in order that the Nashville, Chattanooga & St. Louis tracks might be raised above the high water mark of the Mississippi River before the bad weather sets in. A 70-C Bucyrus shovel and standard equipment consisting of 12 yard cars and locomotive will be used.

Johnnie Warden is engineer, C. D. Hutton cranesman and Joe Hurd fireman.

Michigan

Jackson—The Michigan Central R. R. contemplates double-tracking the line from Jackson to Rives Junction. G. H. Webb, Detroit, Mich., Chief Engineer.

Minnesota

Brainerd—The Northern Pacific contemplates letting a contract for an extension from the Cuyuna-Mille Lacs mine to the Duluth-Brainerd mine.

St. Paul—Central States Dredging Co., 342 Rockefeller Bldg., Cleveland, O., at $61,929, was awarded contract for Roseau River Improvement State Ditch, including 451,054 cubic yards of earth excavation, 84,038 cubic yards hard pan excavation and removing and replacing bridges at $400.

Duluth and Vicinity

Pickands Mather & Company are asking for bids for stripping the Macedon mine near Crystal Falls, Mich.

The Great Northern Railway Company made a nineteen million dollar bond issue which Mr. Louis Hill states is to be used for general improvements all along their line.

It is rumored that some very large stripping contracts are to be let within the near future on the Mesabe range. One of the above mentioned propositions contemplates the stripping of 128 feet of overburden. Details are not procurable at the present writing.

John Wunder and associates of Minneapolis are about to open up a trap rock quarry and are planning to build a large rock crushing plant at Taylors Falls, Minn. They have already placed the order for large rock crushing machinery, for this plant.

Minneapolis—The Minneapolis, St. Paul & Sault St. Marie plans to extend the Ambrose, N. D., line 66 miles further west during the coming summer.

Aitkin—The contract for ditch No. 24, 400,460 cubic yard of excavation, 19¼ miles of road leveling, 80 acres of clearing, etc., was awarded February 4, 1914, to the Northern Construc-

tion Co., Elkhart, Ind. Other bidders were: W. H. Small & Co., W. J. Gleason & Co., D. A. Foley & Co., all of Aitkin.

Mississippi

Pascagoula—The Pensacola & Missouri Valley R. R. Co. (Panama Line) expects to let contracts within the next 90 days for a 100-mile section of the road. Walter G. Seaver, Pascagoula, President.

Missouri

St. Louis—The City of St. Louis have asked for bids on a large tunnel about three miles in length for sewer purposes under the city. H. S. Winn is engineer in charge.

Charleston—Bids will be opened March 18, 1914, at Charleston for improvements in drainage district No. 30.

Length of main ditch, 22,000 feet. Bottom width, 14 feet. Minimum cut, 9 feet. Maximum cut, 19 feet, except last 300 feet at outlet into Mississippi river, which is 22 feet deep. Average cut, about 12 feet. Required berm, 10 feet. Side slopes, 1: 1 Total excavation, 286,108 cubic yards. Floating dipper dredge work. Build in Brewers lake, water the year around. Nearest railroad stations, Wyatt and Birds Point, each being about 6 miles haul from the point of build. This haul can be reduced to two miles by removing and replacing small road bridge. Ditch crosses levee at station 185. Probable rebuild at levee crossing. Right of way 150 wide throughout. Clearing estimated at 70.27 acres. Beginning of work contingent upon sale of bonds. Work to be let March 18, 1914. Terms cash. Contractors not required to take bonds.

This work also embraces the construction of a reinforced concrete culvert 189 feet over all long with steel floodgate and hoist for drainage outlet through levee. Inside diameter of culvert, 10 feet. Height of bench walls, 3 feet. Semi-circular arch, inside radius 5 feet.

All drainage bond issues in Mississippi county have sold for par and above. L. T. Berthe, Charleston, Mo., is engineer for the district.

Montana

Gilman—George Stanberry is erecting a Bucyrus class 24 electric dragline excavator for Yale & Reagan. This machine is to be used on their contract on the Sun River Project. When Mr. Stanberry has completed the erection of this machine he will set up a new Bucyrus class 20 electric dragline for Buchanan & Company here. This concern also has a contract on this same project.

Great Falls—Sealed proposals will be received at the office of the United States Reclamation Service, Great Falls, Mont., until April 15, 1914 for the construction of a portion of the St. Mary Canal, St. Mary Storage Unit, Milk River Project, Mont., involving about 560,000 cubic yards excavation, 7,750 cubic yards of concrete, 13,000 square yards of paving, 700 cubic yards of riprap and 8,500 cubic yards of puddling; the placing of about 485,000 pounds of steel reinforcement bars and 293,000 feet, board measure, of lumber in wooden structures and the erection of about 105,000 pounds of miscellaneous metal work. The work is situated in the Blackfeet Indian Reservation, about 40 miles northwest of Browning, Mont. For particulars address the United States Reclamation Service, Washington, D. C., Great Falls, Mont., or Fletcher, Mont.

Hardin—The Big Horn Canyon Irrigation & Power Co., Edward Lawlor, Secretary, contemplates a 100,000-acre irrigation project including dam and reservoir on the Big Horn River. Work will include a 68-mile railroad.

New York

Port Richmond, Staten Island—(From the Staten Islander February 11th, 1914). Members of the Bucyrus Company, of South Milwaukee, Wis., working at the Staten Island Ship-Building Company's yards got together and had a large feed and general blowout at Wendell's hotel, Port Richmond, last Friday night.

Edward Lapsely, John Watt, John Brand and the Ireland brothers shone brightest as singers, while Micheal Kelly and Edward Madden each tried to outdo the other in telling funny stories.

Several musicians and dancers kept the crowd a-going until 12 p. m.

Before leaving, the "boys" decided to make the "blow-out" a weekly affair, and for that purpose orgainzed the Surycub Club, with the following officers: Thomas Jardine, honorary president; William Welch, honorary first vice-president; Pembroke Taylor, president; Joseph McMaster, treasurer; Henry Uhden, secretary.

The Bucyrus Company is building the two largest dipper dredges in the world for the Panama canal. Mr. Jardine, erecting engineer for the company, in his speech at the dinner, said:

"I am heartily in favor of this idea of forming a club, for it has been shown beyond a doubt that where friendship exists among employees of a company there exists also greater co-operation and higher efficiency."

"This club will strengthen the bonds of friendship between you, and the result will be advantageous both to yourself and to the company. The scheme has my heartiest sanction."

Four Bucyrus Shovels Being Moved Away from a Completed Portion of the Ashokan Dam. Winston & Co., Contractors.

North Carolina

The Atlantic Coast Line has awarded contracts for double tracking 60 miles of main line. The contract was divided in 12-mile sections. W. L. William Company, Inc., Macon, Ga., received contract for Sections 1 and 2; G. W. Lane & Co. Atlanta Ga., for Section 3; J. J. Sheehan, Elkton, Tenn., for Section 4, and A. & C. Wright, Elkton, Tenn., for Section 5. This work will be done between Selma and Packton, N. C.

Albemarle—W. O. Leonard is craning a 70-C Bucyrus shovel here for the Hardaway Contracting Co.

Charlotte—Parker-Brooks Construction Co., Macon, Ga., awarded 5 miles of railroad, to be built in connection with hydro-electric development of Southern Power Co. at Lookout Shoals, N. C.

North Dakota

Ambrosia—The Minneapolis, St. Paul & Sault Ste. Marie R. R. plans to extend the Ambrose line 66 miles further west during the coming summer.

Ohio

Cleveland—The Walsh Construction Co. were recently awarded a contract for about two miles of street railway construction in the suburbs of Cleveland. The work amounts to about five hundred thousand yards of unclassified material.

Cleveland—The city of Cleveland have about six or seven hundred thousand yards of material to move on the site of the proposed filter beds for the city water works system.

Panama—R. W. Hebard & Co., Panama, Pan., and New York City, have been awarded the contract for a 60-mile narrow gage railroad from Podregal to David with branches to Bouquete and

La Concepcion in province of Chiciqui The project will cost $1,600,000.

Columbus—It is reported that the Norfolk & Western R. R. contemplates constructing a third track between Columbus, Ohio, and Portsmouth.

Pennsylvania

Minersville—Richard Krapf has recently been promoted from assistant foreman of the Pine Knot colliery to outside foreman at the Phoenix Park colliery.

Ashland—T. Thomas is running, T. Shearen is craning and L. Bickert is firing a Bucyrus 70-C shovel near here. J. Domino is night man.

Tennessee

Mount Pleasant—H. T. Barnhart is still operating the Crow Contracting Company's class 14 Bucyrus dragline excavator here.

Lewisburg—J. C. Carland has finished his work on the L. and N. near here and is looking about for a new job.

Notes from Knoxville

By G. R. Dempster

Cranesman Walter Brown is still at Paris, Ky. where he has several months work. From the way he is saving his money every one thinks there must be a damsel in view. I wonder!

Parsons is recuperating from a serious attack of pneumonia at his home in Louisville, Tenn. He hopes to be able soon to resume his place behind the levers. The Wilkerson Brothers are at home in the same town.

Jack Dunavant was in town recently after a successful year in Alabama. All shovelmen hope he will make a million this year as he hands a square deal to everyone.

Bruce McCallie secretary and treasurer of the Callahan Co. is very optimistic regarding the outlook for this year. He thinks they will get part of the good work when it comes up. No doubt he will.

C. J. McKinney is kept pretty busy these days, winding up his L. & N. work and that big river farm of his. That would be an ideal winter home for shovelmen during the dull times. I know of one-hundred martyrs who would sacrifice their part of the white lights in order to crane one of his hay-balers.

The Atlantic Coast line awarded fifty-six miles of work to the following contractors: W. S. Williams, Macon, Ga.; C. V. Lane, Atlanta, Ga.; J. J. Sheehan, Roanoke, Va. and A. C. Wright, Ashland ,Va. It is said that work will be started at once.

Jno. McFarland, general contractor, is in Louisiana bidding on fifteen miles of side walk and curb. If he lands it, look out for a five passenger buzz wagon next year.

D. C. Seymour the well known civil and consulting engineer has re-opened his Knoxville office and is busy meeting his old friends. Welcome home!

Chas. Southern was in town a few days ago and said that this pretty weather gives him itchy feet and that he is on the look out for more work.

J. M. Stone, the construction superintendent passed through last week on his way from Virginia. He has fallen away until he only weighs 250 pounds. Too bad!

J. E. Willoughly, assistant chief engineer of that Atlantic Coast line was in town last week on legal business.

The genial Mike Casey the well known Birmingham contractor is visiting the city, at present.

Texas

Josephine—J. F. Favil is craning and J. E. Brown firing a 65 ton Bucyrus shovel for the Cotton Belt Railroad here.

Kittie—The Nueces Valley, Rio Grande & Gulf will soon start construction on the line projected from Kittie, Tex., to the center of McMullen county, 25 miles.

Virginia

Buchanan—It is reported that the Carolina, Clinchfield & Ohio Ry. Co. (Ward Crosby, Chief Engineer, Johnson City, Tenn.) is preparing to build a branch line to Buchanan and will enter Roanoke over the Norfolk & Western R. R., gaining access thereby to Richmond.

Charlottesville—The Southern Railway contemplates double tracking its line between this city and Elma, a distance of 20 miles.

Golddale—J. E. Wiltshire is operating a 95 ton Bucyrus shovel here. He has been on this machine for the last four years and states that it is the best machine he has ever seen for rock work.

Washington

Seattle—Shovel men will be interested to learn that the well known shovel man Michael Woznack is not only a first class operator but an inventor. Mr. Woznack has recently designed a safety attachment for trolley car fenders. This device is extremely simple in its operation and practical in its design. An important feature is that the street car companies will not have to discard the fenders which are now in use on their cars as this device may be used in co-operation with their present fenders. The operation is controlled by the application of brakes.

Tacoma—Porter Bros., railroad contractors, have announced that on March 1st work will be resumed on the Coos Bay line of the Southern Pacific, between Acme and Marshfield, and on the Bruno cutoff of the Northern Pacific railway south of Tacoma. Both of these projects have been tied up during the winter because of unfavorable weather conditions.

Spokane—Contract has been awarded to Gurthrie, McDougall & Co., Spokane, for construction of 65 miles of line in British Columbia for Kettle Valley Railroad.

West Virginia

Princeton—W. S. Thorne is operating an Atlantic type shovel for the Virginia railroad near here.

Foreign

The Chinese government has authorized the issue of twenty million dollars of bonds for the reclamation of an area of about 17,000 square miles in the Huai River valley in China, the object of which is to prevent the disastrous floods which have been recurring for many centuries with tremendous loss of life. The work is to be undertaken by the J. G. White Engineering Corporation, 43 Exchange Place, New York City. Confidence is expressed in the ability of the Chinese government to find a market for the bonds.

The project is the result of a suggestion made about three years ago by the American Red Cross Society. The Chinese government refused to authorize the work unless the Society would undertake the general supervision. The work in general will involve the dredging of the rivers in order to deepen the channels, the digging of new canals and the construction of dams and reservoirs. Approximately six years will be required to complete the work. It is estimated that it will afford employment for about one hundred thousand men.

When the Oceans Met!

WHEN the last bit of earth separating the Atlantic and Pacific was removed the dream of many years was a reality. A big job and a wonderful engineering feat. It took modern machinery for this work.

WESTERN DUMP CARS

Were Used and Established New Records for Handling Material.

Not this gigantic enterprise alone but every one of the immense earth moving projects on the American continent in recent years, practically without an exception, was accomplished or is being done by these cars; for instance, the Lackawanna Cut Off, the Keokuk Dam, the Selkirk Tunnels, the Welland Canal, the Mississippi levees at East St. Louis, the enormous stripping undertakings on the Mesabe Iron Range, and railroad construction on hundreds of different roads.

If the job is large or small, you need them.

WESTERN WHEELED SCRAPER CO.

Earth and Stone Handling Machinery.

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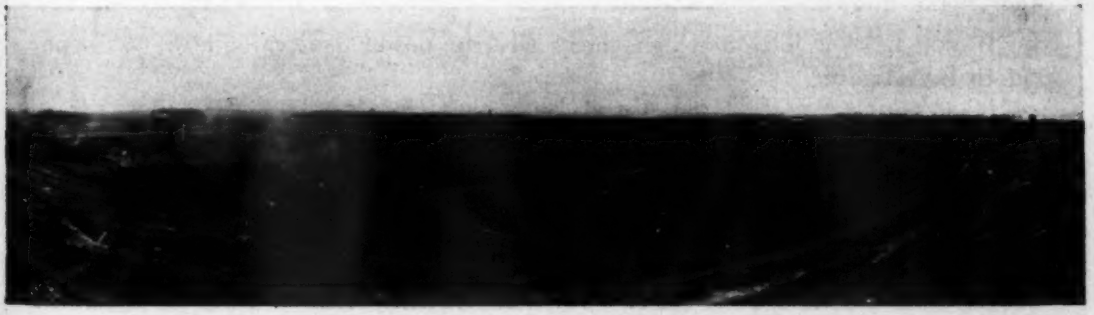

Open-cut Iron Mine, 1¼-miles long, ¼-mile wide, 200 feet deep, on Mesabe Range, Hibbing, Minn.

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Bucyrus Class 9½ Electric Dragline—1½ Yard Bucket. Operated by the United States Reclamation Service, Caldwell, Idaho.

On the United States Reclamation Projects in Montana, Idaho and Nevada Seven Bucyrus Electric Draglines are Used

This is the result of a thorough test by the Reclamation Service by which it was demonstrated that Bucyrus Electric Draglines give better results than any other make known.

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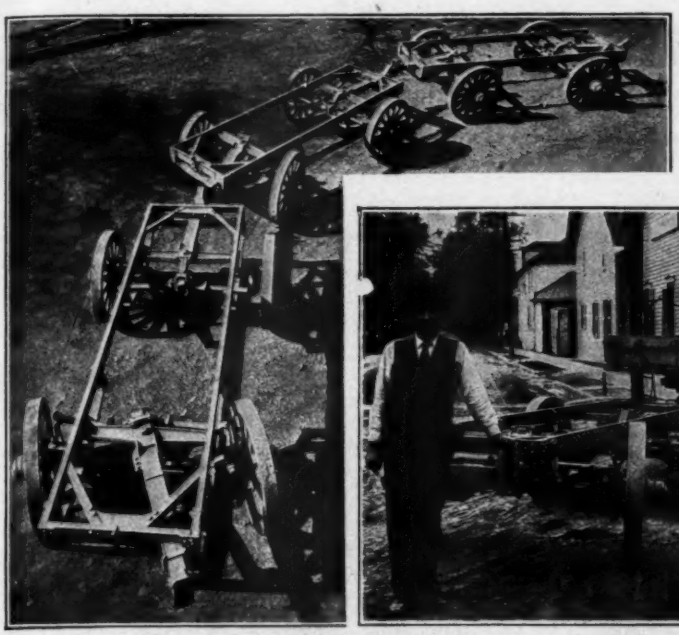

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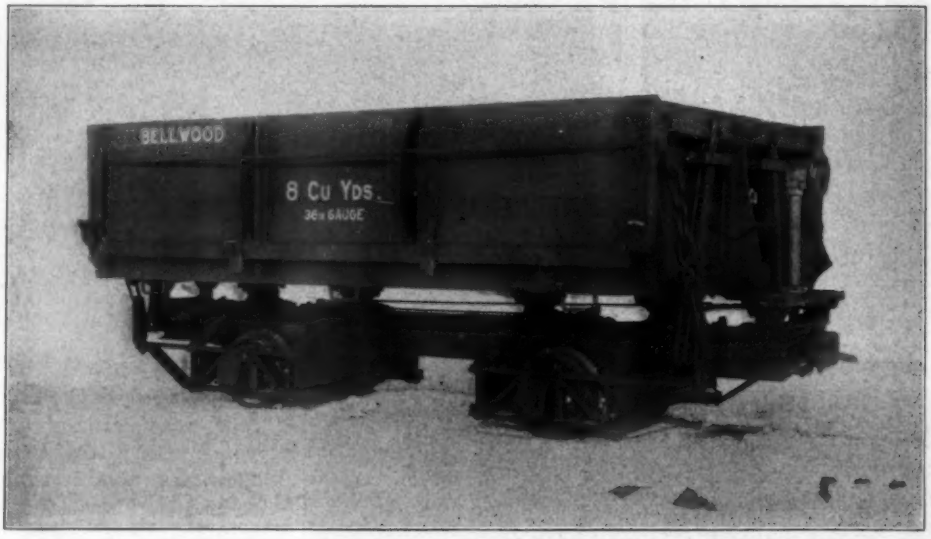

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Are running over contractors' tracks without derailing.
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Are built in capacities from 1 to 20 CUBIC YARDS.

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All Steel Construction. **Operated by One Man.**

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It spreads to 45 feet in width, cuts a grade to 24 inches below and to 17½ inches above top of rails.

Built in 80,000 to 100,000 pounds capacity.

Easily operated by one man. Adjusted by pneumatic control.

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It takes little time for corrosion and disintegration to take place when metal is exposed to the elements.

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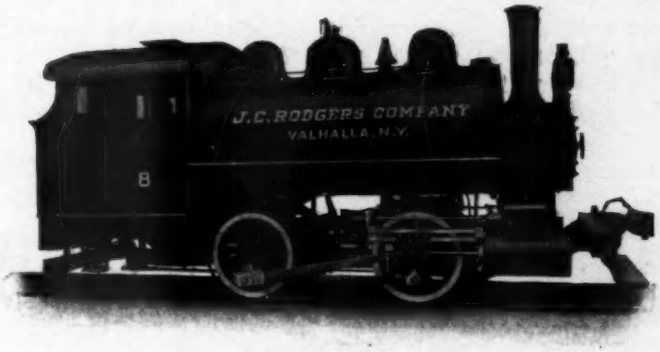

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You may buy some cheaper grades of Shovel Chain than "XX" but our High Grade "XX" Chain is always cheaper in the end. *Send for catalogue and prices.*

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"TIGER" STEEL BUNKS

are a real investment for a contractor. They never break down like a wooden cot. Need no packing for shipping, and even if shipped from camp to camp in cars with other equipment, there is no danger of injury. Are absolutely bug-proof. The spring fabric, though elastic, can never sag, The complete bunk is coated with rust proof black enamel. All sizes, either double or single deck.

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Welding Crack in Cast Steel Center for Steam Shovel.
This part valued at $300 was repaired by the Oxweld Process for less than one-tenth of its value in 4½ hours.

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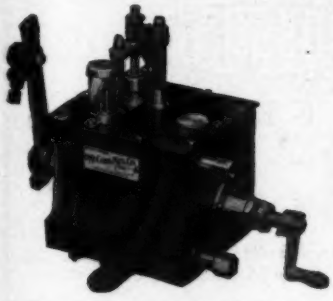

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No Pressure in Glass
All Mechanism Running in Oil
Auxiliary Hand Crank
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Not Affected by Jarring

Starts, stops and changes speed with the engine. Delivers one drop or a full stream per stroke and you can *see* just how much is being pumped; while the gauge glass shows the oil level.

"McCord" *Force Feed* Lubricators

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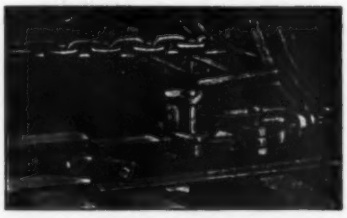

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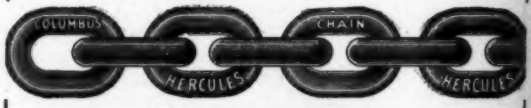

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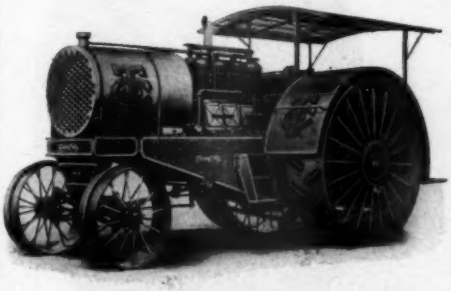

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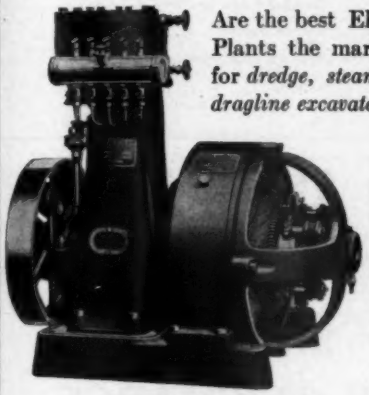

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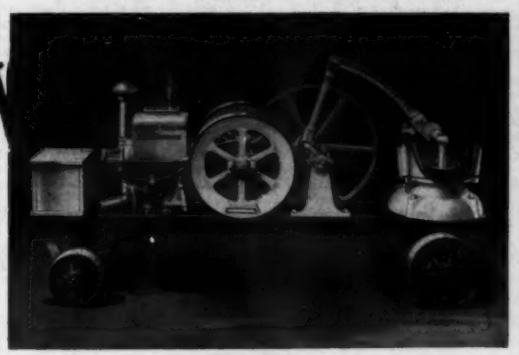

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4—55 Ton 18 x 24 TEN WHEEL
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